

## Oral Exercises

Give each equation in exponential form.

1.  $\ln 4 = 1.39$

2.  $\ln \frac{1}{4} = -1.39$

3.  $\ln e = 1$

Give each equation in logarithmic form.

4.  $e^2 = 7.39$

5.  $e^{-2} = 0.14$

6.  $e^{1/5} = 1.22$

Simplify.

7.  $\ln \frac{1}{e}$

8.  $\ln e^{12}$

9.  $\ln \sqrt{e}$

## Written Exercises

Write each equation in exponential form.

A 1.  $\ln 8 = 2.08$

2.  $\ln 100 = 4.61$

3.  $\ln \frac{1}{3} = -1.10$

4.  $\ln \frac{1}{e^2} = -2$

Write each equation in logarithmic form.

5.  $e^3 = 20.1$

6.  $e^7 = 1097$

7.  $e^{1/2} = 1.65$

8.  $\sqrt[3]{e} = 1.40$

Simplify. If the expression is undefined, say so.

9.  $\ln e^2$

10.  $\ln e^{10}$

11.  $\ln \frac{1}{e^3}$

12.  $\ln \frac{1}{\sqrt{e}}$

13.  $\ln 1$

14.  $\ln 0$

15.  $e^{\ln 5}$

16.  $e^{\ln 0.5}$

Write as a single logarithm.

17.  $\ln 3 + \ln 4$

18.  $\ln 8 - \ln 2$

19.  $2 \ln 3 - \ln 5$

20.  $\ln 7 + \frac{1}{2} \ln 9$

21.  $\frac{1}{3} \ln 8 + \ln 5 + 3$

22.  $4 \ln 2 - \ln 3 - 1$